Digital Assets – A glimpse into the world of smart custody

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Cryptocurrency, Non-Fungible tokens (NFTs), Distributed Ledger Technology (DLT), De-fi tokens, Blockchain and Smart Contracts are some of the trending buzzwords these days. No industry conferences and internal executive meetings are complete without these terms being mentioned and discussed in different ways. Every market player wants to leverage these emerging technologies to stay ahead of the curve. As tech-savvy Gen Z and millennials enter the workforce, the need for investments in digital assets is all set to grow at an exponential rate. Digital assets are the new gold for young investors. Though cryptocurrencies, NFTs, and other digital assets are in the spotlight, we are also keenly looking to understand how the underlying technology of Distributed ledger will shape the custody of such digital assets. These technologies can make clearing and settlement as easy as a UPI transaction. Many stakeholders are beginning to realize the use cases and the potential benefits.

Digital assets

The digital representation of value operating on peer-to-peer network with the help of cryptography and enabled by distributed ledger technology is called the digital asset. Generally, these digital assets operate on a decentralized network with no central authority. Currently, most of the digital assets are intangible. However, there is an increasing trend of digital assets backed by real-world assets. There are various types of digital assets like Cryptocurrency, NFT tokens, Security Tokens, Stablecoin, Utility tokens, etc.

Cryptocurrency is a virtual currency, secured by cryptography and works as a medium of exchange. It is the most popular digital asset. Bitcoin and Ether are the popular examples of the cryptocurrency. Investors are starting to see Bitcoin as the store of value and hedge against inflation. It is much easier to transport when compared to passing a bar of gold!

A Non-Fungible token (NFT) is a piece of digital asset that is unique and irreplaceable. It is a token to represent ownership of a unique asset. At any given point in time, there can be only one owner. An INR 10 coin can be swapped for another coin, which makes it fungible. However, NFTs are authentic and non-fungible and has hence perhaps found application in digital art collectibles.

Alarmed by the raise of decentralized cryptocurrency, central banks around the world have started projects on issuing digital currencies. Central bank digital currency (CBDC) is a digital form of the country's fiat currency. CBDC are exclusively available in digital form and does not take the physical form. The extent of the decentralization will depend on the design of the CBDC. China is the first major economy to pilot the use of digital yuan. More central banks are expected to follow. Unlike cryptocurrency, CBDC enjoys legal tender status, which will increase adoption. CBDC transaction are expected to happen instantaneously and at a much lower transaction cost.

Digital asset custody

In the case of traditional assets, custodians are responsible for the safekeeping of the securities in either physical form or the dematerialized form. However, in the case of custody of digital assets, it is all about secure key management of digital wallets. Technological infrastructures and strong encryption are expected to play a crucial role in the custody of digital assets. A comprehensive insurance cover will also provide assurance to institutional clients.

Cryptocurrency transactions are enabled by the usage of combination of the public and private keys. While a public key is like an address with which other people can send you crypto assets, a private key works like a password and allows the holder to access the wallet. So owning a crypto asset means holding the private key. Digital Asset custody involves the safekeeping of the private key and providing controlled access to the key with state-of-the-art cybersecurity to prevent third-party access. Since the cryptocurrency transactions are irreversible, the protection of the private key from misuse is paramount.

As things stand, there are broadly two types of Key storage systems:

Hot storage: The private key is stored in online wallets and can be accessed anywhere as long as one has an internet connection. This enables ease of transaction but is obviously exposed to the digital threats.

Cold Storage: Here the private key is stored offline in a standalone computer, pen drives, etc., or old fashion way of writing on a piece of paper or memorizing. Though it is protected from digital threats, there are various other kinds of risks involved. As case in point is the QuadrigaCX instance, where CEO Gerald Cotton was the only person who had the password to the company's cold storage

wallet. He died in December 2018, making it impossible to retrieve the cryptocurrencies worth $140 million.

Need for custodian for digital assets

The growing interest in digital assets from institutional investors is primarily a call for custodians to help in managing risk, regulatory compliance, and to provide value-added service on top of the basic safekeeping. Custodians can be expected to play a key role in digital asset safekeeping. Some of the areas where custodians can be expected to add value are:

Voice of the investors: Custodian will represent the investor's interest to the regulators. They will act as a representative for their clients. This will lead to positive developments of the regulatory regime and help in addressing any challenges in the framework for digital assets

Enhanced Security: Custodians can collaborate with cybersecurity experts to thwart the threats from hackers, which might be a costly affair for an individual investor. Custodians can provide safe and regulated wallets or storage platforms. They have robust risk management solutions for safekeeping of the digital assets of the investors. In the unlikely event of loss or theft to the holdings, Custodians can provide a recourse action through their insurance cover.

Operational efficiency: The complex nature of digital assets can intimidate new investors. Custodians can help improve market participation by simplifying the operations and bringing confidence to institutional clients.

Though cryptocurrency and other digital assets are presently considered as high-risk investments due to their high volatility and speculation, the underlying technology has immense potential to transform the digital landscape in many industries.

Need for change in traditional custody

Late in the 1960s, when trading in Wall Street happened via paper certificates, and settlement used to happen over five business days, rising volumes forced the markets to shut for few days to allow the back office to clear their backlogs. This process was saddled with problems like duplication, errors, and delays. This changed with the advent of computerized bookkeeping which made it possible to reach the current settlement cycle of T+2. Even the current systems are neither efficient nor fully automated. There is a requirement for constant reconciliation within and outside the entities and the settlement process still requires manual intervention in some shape or form. The main cause of the problem is that the intermediaries involved use different systems, which in turn use different formats. Hence, there is a need for reconciliation across the lifecycle of the transaction. This leads to redundancies and waste of resources. This leads one to ask: when you can get same-day delivery of physical goods ordered online, why should the securities settlement happen after two days?

Enter DLT for smart post-trade settlement

Distributed Ledger Technology (DLT) is the underlying technology that enables cryptocurrency. It is the system of recording the transaction in multiple places simultaneously thereby creating an immutable ledger, which enables the secure financial transaction. It is a highly resilient system with numerous redundant data stores with continuous synchronizing. This simultaneous communication improves data quality, efficiency, and speed. This can help reduce the unnecessary dependencies between the financial intermediaries.

There are various types of DLTs like Blockchain (underlying technology of Bitcoin), Hashgraph, etc. DLT based systems can help overhaul the current post-trade infrastructure or alternatively supplement the current system depending on the nature of development by the existing central counterparty. Several jurisdictions are considering replacing the Central Securities Depository (CSD) with DLT to form a single source of trusted data.

Some of the use cases of DLT are:

- **Tokenization**: Representation of financial instruments in form of digital tokens, which is easier to trade and also facilitates fractional ownership
- **Smart contracts**: Contract is based on multiple sets of rules and triggers which will ensure automated execution of contracts and operations when the rules are satisfied which allows for greater automation. Smart contracts can be applied to derivative products and corporate action processing.
- **Trusted data source**: DLT is a peer-to-peer network, which creates immutable ledgers and gives a lot of transparency and trust to the system. Hence, it removes the need for centralized authority.

Experimental projects have established the benefits of DLT in increasing operational efficiency and better liquidity management. DLT can remove the need for reconciliation by ensuring data integrity by propagating the data to all parties in real-time. This can lead to a shortening of the settlement cycle. With the reduced settlement cycle, we could enjoy the benefit of increased turnover, extended trading sessions and better liquidity in the market.

Hurdles in the adoption of DLT based post trade system and digital assets

Cyber threat is the foremost risk with the custody of digital assets. Since digital assets (like bitcoin) require the safekeeping of the client's private keys, there is a higher chance of threat from hackers. However, by creating backups in multiple locations and having resilient cybersecurity, this risk can be minimized. The environmental groups are also raising red flags about the high-energy requirement of these systems. For instance, a single bitcoin transaction consumes the same energy as 1.2 million VISA transactions. However, crypto-enthusiasts claim that the proof of stake model consumes 99% less energy than the proof of work model (used by

Bitcoin). As the underlying technology evolves, we will perhaps witness increasing efficiency.

Regulation and standards

We need a definitive regulatory framework that can propel the growth of adoption in DLT based smart custody and digital asset custody. Many financial institutions are waiting for regulatory approval to launch Bitcoin exchange traded-funds (ETF), which can widen the access of the digital asset to the investors. Regulators are wary about the circumvention of the regulatory controls and the high volatility of this asset class, which could result in value erosion for the investor.

At present, uncertainty in regulations is hampering investment in these technologies. Institutions are in wait and watch mode to get a comprehensive regulatory framework about digital assets and the development of DLT based post-trade services. Regulators are in the process of evaluating this space to help the pace of innovation. Regulators are certainly contemplating shortening the settlement cycle.

At the moment there are no global standards for DLT systems, which can elevate risk as entities can curate bespoke DLT solutions, which could disturb the harmonization goal as they might not be interoperable. There is hence a need for standards and specifications. Regulators in Japan, Singapore, Switzerland, and Hong Kong seem to have taken on a more active role in developing regulations around the development of digitalized tokens and laws governing their treatment as securities.

Conclusion

While the future of DLT and digital assets is still evolving, a definitive regulatory framework and the development of the underlying technologies will help achieve faster progress. Digital assets are here to stay and custodians are certainly looking to develop and invest in the required technology. Once DLT based systems move from experimentation to commercialization, we can see benefits getting unlocked across the entire value chain.